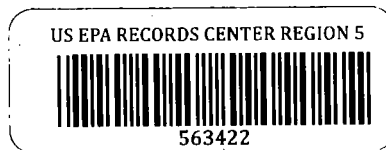




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May 30, 2014

420125

Mr. Erik Hardin
Remedial Project Manager
U.S. Environmental Protection Agency Region 5
77 West Jackson Boulevard
Chicago, Illinois 60604-3590

Subject: Behr Dayton Thermal Site (WA No. 138): Data Quality Objectives for Work Plan Revision
Request No. 1, Revision 1

CH2M HILL is submitting amended Worksheets 11, 15-1, and 15-2 to the U.S. Environmental Protection Agency (EPA) for inclusion in the project quality assurance project plan (QAPP) dated June 9, 2010. The amended worksheets reflect updates to the sampling process for soil and groundwater as scoped in the approved Work Plan Revision Request No. 1, Revision 1, which was submitted on January 31, 2014, and approved on February 21, 2014. The following sections summarize the updates to the data quality objectives (DQOs) (Worksheet 11) and the analytical method quantitation limits (Worksheets 15-1 and 15-2).

Worksheet 11—Data Quality Objectives

The following two DQOs are addressed:

- Groundwater: Delineate the volatile organic compound (VOC) groundwater plume to the extent needed to identify non-site-related VOC releases to groundwater.
- Soil: Gather sufficient soil data to calculate exposure point concentrations and background concentrations for a screening-level human health risk assessment (SLHHRA).

Groundwater

The goals of the groundwater DQOs are to delineate the extent of the VOC preliminary chemicals of potential concern in groundwater, and to identify any areas of the VOC groundwater plume that may not be related to releases from any of the three potentially responsible party (PRP) facilities.

Up to 250 wells from the existing site and regional monitoring well network of approximately 360 wells will be sampled during a sitewide sampling event. Water levels will also be measured in the 250 wells. Based on the results of the 250-well sampling event, two smaller-scale sampling events may be performed to fill any identified data gaps. The groundwater samples will be analyzed for VOCs, and groundwater potentiometric maps will be prepared using the water level data.

If individual VOC concentrations in a sample exceed the project action levels (that is, risk-based screening levels presented in Worksheets 15-1 and 15-2), that sampling location will be considered part of the site groundwater VOC plume unless it meets one or both of the following criteria:

- If individual VOC concentrations in a sample exceed project action levels and are located hydraulically upgradient of the site, then that sampling location will be considered as a non-PRP-related sample result.

- If individual VOC concentrations in a sample exceed project action levels and are separated from the site plume by VOC concentrations lower than detection limits, the sampling location will be considered to be a non-PRP-related sample result.

Soil

The goals of the soil DQO are to acquire sufficient shallow soil samples to calculate exposure point concentrations for the SLHHRA, and to establish background concentrations. Soil samples will be collected from depth intervals of 0 to 0.5 foot below ground surface (bgs), 4 to 6 feet bgs, and 8 to 10 feet bgs at all locations. The new data will be combined with existing soil data to calculate exposure point concentrations for the SLHHRA.

To fill a data gap identified in the SLHHRA, soil samples will be collected from five soil borings at the Gem City facility, seven soil borings at the Aramark facility, and three soil borings at the Mahle Behr facility. The facility soil samples will be analyzed for VOCs, semivolatile organic compounds, and target analyte list metals.

To assess background conditions in areas presumably not impacted by the facilities, soil samples will be collected from 10 soil borings across the residential neighborhood located inside the site but away from the three facilities. The background samples will be analyzed for target analyte list metals and anthropogenic polycyclic aromatic hydrocarbons.

Worksheets 15-1 and 15-2 (Analytical Quantitation Limits)

Two worksheets, 15-1 (soil) and 15-2 (groundwater), were amended with updated potential contaminants of concern, project action limits (PALs), and achievable laboratory limits. The potential contaminants of concern were updated as a result of the *Screening Level Human Health Risk Assessment* (CH2M HILL 2012). The PALs were updated to reflect the revisions in the November 2013 EPA Regional Screening Levels. Both the method detection limits (MDLs) and reporting limits (RLs) were updated to reflect the use of the Contract Laboratory Program (CLP).

The Chicago Regional Laboratory (CRL) was used for the analytical work associated with the groundwater samples, and the CLP is planned for the analytical work associated with the soil samples. To satisfy the project specific requirements for this sampling effort, the CRL performed an MDL study to demonstrate that it could meet or approximate the PALs for the groundwater sampling.

Worksheet 15-1 indicates that the soil method detection limits (MDL) are "To Be Determined" because the specific laboratory in the CLP pool will not be selected until just prior to the fieldwork and sample collection. However, since all reporting limits are already established through a contractual requirement between the CLP and EPA, it can be stated that all soil project action limits will be satisfied.

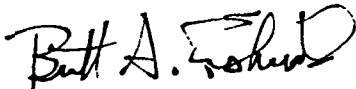
Worksheet 15-2 indicates that seven groundwater analyte's RLs are greater than the PAL. However, as a result of the CRL's MDL study, it was demonstrated that the MDL value meets or exceeds the PAL for four analytes, which will allow for the use of a qualified result. The remaining three analytes for which both the MDL and RL values exceed the PAL will be addressed in the uncertainty section of the risk assessment.

MR. ERIK HARDIN
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If the changes meet with your approval, please replace the applicable pages of the current QAPP with the enclosed revised worksheets. If you have any questions regarding this submittal or the project in general, please do not hesitate to call me at 937-220-2955.

Sincerely,

CH2M HILL



Brett Fishwild
CH2M HILL Project Manager



Theresa Rojas
CH2M HILL Program Quality Manager

c: Alida Roberman, EPA (electronic and hardcopy)
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Worksheet #11—Project/Data Quality Objectives

TABLE 11-1
Data Quality Objectives

DQO #	Step 1: Statement of Problem	Step 2: Identify Goals of the Study	Step 3: Identify Information Inputs	Step 4: Define Boundary Studies	Step 5: Develop Analytical Approach	Step 6: Specify performance or acceptance criteria	Step 7: Develop plan for obtaining data
1	The groundwater VOC plume at and around site has not been delineated to the extent needed to identify non-site-related VOC releases to groundwater. Some areas of the groundwater VOC plume at the site may not originate from the three PRP facilities.	Determine the extent of the VOC preliminary chemicals of potential concern (pCOPCs) and the degradation products of trichlorethene and tetrachloroethene in the groundwater plume. Identify if there are area(s) of the VOC plume that may not be related to one of more of the PRP facilities.	<ul style="list-style-type: none"> Collect groundwater samples sitewide from up to 250 monitoring wells. Data gaps in the delineation may be filled by up to two additional smaller-scale sampling events. Conduct two rounds of sitewide depth-to-groundwater measurements from approximately 250 monitoring wells. Existing groundwater VOC data, collected as part of the RI. Existing groundwater potentiometric maps, prepared as part of the RI. Site-specific screening-level objectives as defined by Worksheet 15. 	The involved monitoring wells will be selected from the existing well network of approximately 360 wells.	<ul style="list-style-type: none"> The groundwater samples will be analyzed for VOCs, and groundwater potentiometric maps will be prepared using the depth-to-groundwater measurements. If the individual VOC concentrations in a sample exceed the screening levels, then that sampling location will be considered to be part of the groundwater VOC plume. If the individual VOC concentrations in a sample exceed screening levels and are located hydraulically upgradient of the site, then that sampling location will be considered as a non-PRP-related release. If the individual VOC concentrations in a sample exceed project action levels and are separated from the main site plume by concentrations less than detection limits, the sampling location will be considered a non-PRP-related release. 	Refer to UFP QAPP Worksheets 24, 28, and 36 for acceptance and performance criteria. Laboratory data are usable if acceptable by data validators (refer to UFP QAPP worksheet 37 for data usability criteria).	<ul style="list-style-type: none"> Up to 250 wells to be sampled during the sitewide groundwater sampling event will be selected from the 360 wells in the existing well network. The wells will be selected based on existing VOC groundwater data and existing groundwater potentiometric maps. After the sitewide sampling results have been evaluated, up to two additional smaller-scale (for example, approximately 20 wells) well sampling events may be conducted to fill any identified data gaps. The 250 wells to be measured for depth to groundwater will be selected from the 360 wells in the existing well network. The wells will be selected based on existing potentiometric maps.

2	<p>There are insufficient shallow soil data to support the delineation of the extent of contamination and specifically for exposure point concentration calculations for conducting a screening-level human health risk assessment (SLHHRA).</p>	<p>Acquire sufficient shallow soil samples at the three facilities and analyze samples for pCOPCs to include target analyte list (TAL) metals, VOCs, and SVOCs to delineate extent and to calculate exposure point concentrations for the SLHHRA.</p> <p>Establish background metals concentrations and background anthropogenic PAH concentrations in soils.</p>	<ul style="list-style-type: none"> Existing shallow soil data Collect soil data from 25 additional soil borings. Fifteen soil borings from the 3 facilities, and 10 soil borings from background locations. Site-specific screening-level objectives as defined by Worksheet 15. 	<p>Spatial: The study boundary includes locations with potentially complete exposures to known impacts on or emanating from the facilities.</p> <p>Vertical: Collection of soil samples at depth intervals of 0 to 6 inches, 4 to 6 feet, and 8 to 10 feet.</p>	<p>The facility soil samples will be analyzed for TAL metals, SVOCs, and VOCs that are identified as pCOPCs. The new and existing soil data will be used to calculate exposure point concentrations for the SLHHRA.</p> <p>The background/anthropogenic soil samples will be analyzed for TAL metals and PAHs, which will be compared to facility-related data.</p>	<p>Refer to UFP QAPP worksheets 24, 28, and 36 for acceptance and performance criteria.</p> <p>Laboratory data are usable if acceptable by data validators (refer to UFP QAPP Worksheet 37 for data usability criteria).</p>	<ul style="list-style-type: none"> Five soil borings will be installed at the Gem City property. Seven soil borings will be installed at the Aramark property. Three soil borings will be installed at the Behr property. <p>Up to 10 soil borings will be installed in areas not impacted by facility activities to provide background and anthropological sources.</p>
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Worksheet #15-1—Project Action Limits and Laboratory-Specific Detection/Quantitation

Matrix: Soil

Analytical Group: Metals, SVOCs, VOCs

Concentration Level: Low

Analyte ^a	Analyte Class	CAS Number	Project Action Limit ^b (mg/kg)	Achievable Laboratory Limits	
				MDLs (mg/kg) ^d	RLs (mg/kg)
Arsenic, Total	Metals	7440-38-2	0.6	TBD	0.5
Chromium, Total	Metals	7440-47-3	120,000	TBD	1
Chromium, Hexavalent ^e	Metals	18540-29-9	0.3	TBD	N/A
Cobalt, Total	Metals	7440-48-4	23	TBD	0.5
Iron, Total	Metals	7439-89-6	55,000	TBD	N/A
Manganese, Total	Metals	7439-96-5	1,800	TBD	0.5
Nickel, Total	Metals	7440-02-0	1,500	TBD	0.5
Thallium, Total	Metals	7440-28-0	0.8	TBD	0.5
Vanadium, Total	Metals	7440-62-2	390	TBD	2.5
Benzo(a)Anthracene	SVOCs	56-55-3	0.2	TBD	0.0033
Benzo(a)Pyrene	SVOCs	50-32-8	0.02	TBD	0.0033
Benzo(b)Fluoranthene	SVOCs	205-99-2	0.2	TBD	0.0033
Chrysene	SVOCs	218-01-9	15	TBD	0.0033
Dibenzo(a,h)anthracene	SVOCs	53-70-3	0.02	TBD	0.0033
Indeno(1,2,3-cd)pyrene	SVOCs	193-39-5	0.2	TBD	0.0033
Naphthalene	SVOCs	91-20-3	4	TBD	0.0033
cis-1,2-Dichloroethene ^c	VOCs	156-59-2	160	TBD	0.005
1,1-Dichloroethene ^c	VOCs	75-35-4	240	TBD	0.005
trans-1,2-Dichloroethene ^c	VOCs	156-60-5	150	TBD	0.005
Trichloroethene	VOCs	79-01-6	0.9	TBD	0.005
Vinyl Chloride ^c	VOCs	75-01-4	0.06	TBD	0.005

SVOCs = semivolatile organic compounds, VOCs = volatile organic compounds, MDL = method detection limit, RL = reporting limit, NA = not applicable, mg/kg = milligram per kilogram

^a Preliminary chemical of potential concern identified in the Screening Level Human Health Risk Assessment (CH2M HILL, 2012)

^b Residential Soil Regional Screening Level (USEPA, 2013a)

^c Included as a breakdown daughter product of trichloroethene; not identified as a COPC in CH2M HILL (2012).

^d TBD = "to be determined." CLP laboratory MDL values are not determined until just prior to sample collection.

^e samples for hexavalent chromium will only be collected if required by USEPA after review of total chromium values.

CH2M HILL. 2012. *Screening-Level Human Health Risk Assessment for the Behr Dayton Thermal System VOC Plume Site, Dayton, Ohio*. December.

USEPA. 2013a. *Regional Screening Levels*. November. URL: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm

Worksheet #15-2—Project Action Limits and Laboratory-Specific Detection/Quantitation

Matrix: Groundwater

Analytical Group: VOCs

Concentration Level: Low

Analyte ^a	Analyte Class	CAS Number	Project Action Limit ^b (µg/L)	Achievable Laboratory Limits	
				MDLs (µg/L)	RLs (µg/L)
1,1,1-Trichloroethane	VOCs	71-55-6	7,417	0.4	1
1,1-Dichloroethane	VOCs	75-34-3	2	0.4	1
1,1-Dichloroethene ^d	VOCs	75-35-4	196	0.5	1
1,2-Dichloropropane	VOCs	78-87-5	0.4	0.4	1 ^e
1,4-Dioxane	VOCs	123-91-1	0.7	8.8	10 ^f
Chloroform	VOCs	67-66-3	0.2	0.4	1 ^f
cis-1,2-Dichloroethene	VOCs	156-59-2	28	0.4	1
Cis-1,3-Dichloropropene	VOCs	10061-01-5	0.4 ^c	0.4	1 ^e
Methylene Chloride	VOCs	75-09-2	10	0.4	1
Tetrachloroethene	VOCs	127-18-4	10	0.4	1
trans-1,2-Dichloroethene ^d	VOCs	156-60-5	86	0.5	1
trans-1,3-Dichloropropene	VOCs	10061-02-6	0.4 ^c	0.3	1 ^e
Trichloroethene	VOCs	79-01-6	0.4	0.4	1 ^e
Vinyl Chloride	VOCs	75-01-4	0.02	0.5	1 ^f

VOCs = volatile organic compounds, MDL = method detection limit, RL = reporting limit, µg/L = microgram per liter

^a Preliminary chemical of potential concern identified in the Screening Level Human Health Risk Assessment (CH2M HILL, 2012)

^b Lowest of Residential Tap Water Regional Screening Level (USEPA, 2013a) and Groundwater-to-Indoor Air Screening Level (USEPA, 2013b).

^c Project Action Level based on 1,3-Dichloropropene.

^d Included as a breakdown daughter product of tetrachloroethene and trichloroethene; not identified as a COPC in CH2M HILL (2012).

^e Reporting Limit exceeds the PAL, but the MDL is meets the PAL. Qualified results will be used.

^f Both the Reporting Limit and the MDL exceeds the PAL. Results of these analytes will be assessed in the uncertainty section of the risk assessment.

CH2M HILL. 2012. Screening-Level Human Health Risk Assessment for the Behr Dayton Thermal System VOC Plume Site, Dayton, Ohio. December.

USEPA. 2013a. Regional Screening Levels. November. URL: http://www.epa.gov/reg3hwmd/risk/human/rb-concentration_table/Generic_Tables/index.htm

USEPA. 2013b. Vapor Intrusion Screening Levels. December. URL: <http://www.epa.gov/oswer/vaporintrusion/guidance.html#item6>